

California Department of Fish and Game
722 Capitol Avenue
Sacramento , California

MARINE RESOURCES OPERATIONS
Cruise Report 60-S-5-Shrimp

Vessel: N. B. SCOFIELD

Dates: Departed San Pedro September 16, 1960.
Returned San Pedro October 30, 1960.

Localities: Coastal waters off southern, central and northern California.

- Purpose:
1. To conduct exploratory fishing operations for pink shrimp (Pandalus jordani).
 2. To determine sizes, sexes, and weight of shrimp from different areas.
 3. To obtain bottom temperatures in shrimp fishing areas.
 4. To identify, measure and weigh incidental fish catches.

Results: 1. Exploratory Operations

A total of 168 tows was made with a 20- x 8-ft. beam trawl having a nylon net of 1 1/4-inch mesh. These tows included 47 in Area A from the Oregon-California border to False Cape; 36 in Area B-1 from Big Flat to Pt. Arena; 28 in Area B-2 from just south of Pt. Arena to the Russian River; and 57 in Area C from San Simeon to Santa Cruz Island.

The best shrimp catches in Area A were made off Patrick Pt. in 50-55 fathoms, and west of Redding Rock in 54 fathoms. Tows in these areas produced catches at the rate of 1,650 and 1,080 pounds per hour respectively. Operations from the Oregon border to Pt. St. George produced shrimp at the rate of 275 pounds per hour, in 58 to 68 fathoms. Although shrimp were taken in 44 of 45 tows between the Oregon border and Trinidad Head, only in 18 tows were they taken at a rate greater than 200 pounds per hour. No shrimp were caught in two tows south of the Eel River near False Cape, but one tow produced 232 (approximately 464 pounds) market crabs (Cancer magister). These were taken at a depth of 75 fathoms and all were soft.

Operations in Area B-1 revealed a large and heavily concentrated school of shrimp in the Usal-Cape Vizcaino area. This school was approximately 13 miles long and 2.5 miles wide, and was in 55 to 75 fathoms of water. Fifteen tows made along the entire length and width of the school, yielded an average catch of 1,598 pounds per hour. The most productive tow took shrimp at the rate of 3,000 pounds per hour. Seven tows in the Big Flat area were not as productive. The best tow here caught shrimp at the rate of 330 pounds per hour in 55 fathoms. Shrimp

appeared to be thinned out in the Westport area. This area, which had good commercial shrimping in August, had a catch rate of less than 210 pounds per hour. Five tows off the Navarro River in 51-64 fathoms produced only a few shrimp of the year-- 12 individuals about 6 months old were captured in one tow.

In Area B-2 a small shrimp school was located off Ft. Ross in 49 to 52 fathoms. The school was approximately 5 miles long and 1.5 miles wide. Five tows yielded an average catch of 622 pounds per hour. The most productive catch was at the rate of 1,000 pounds per hour. Shrimp were not found in commercial quantity off the Russian River in 40-47 fathoms. This is where shrimp were found last April during SCOFIELD cruise 60-S-2. Tows off Saunder's reef in 51 to 54 fathoms did not yield shrimp.

In Area C tows were made off San Simeon, Estero Pt., Avila and Pt. Sal. The most successful were off San Simeon and Estero Pt., and produced catches per hour of 172 and 174 pounds respectively. Depths in these areas were 122 and 115 fathoms. The heaviest concentration was found 9 miles southwest of Avila in 110 to 120 fathoms. Three tows yielded an average of 910 pounds per hour. The best catch was at the rate of 1,650 pounds per hour. Heavy seas prevented further exploration. The fishery existed at this locality in 1952 and 1953 but since then landings have declined and few shrimp were found there by the commercial fleet.

One tow, 15 miles southwest of Pt. Sal, in 126 fathoms produced a catch of 570 pounds per hour. This was the general locality where three commercial vessels landed 75,000 pounds last season. In addition, six tows were made off Gaviota and 23 were made off the channel side of Santa Cruz Island. Although not in commercial concentration in these localities, shrimp were taken in every tow off Gaviota and in 14 of the 23 tows off Santa Cruz Island. The best tow off Gaviota (in 120 fathoms) produced 69 pounds per hour. The most productive tow off Santa Cruz Island was in 127 fathoms and yielded 75 pounds per hour.

2. Size, Sex, Weight and Count of Shrimp

Samples of shrimp were obtained in all areas and in 130 of the 168 tows. Approximately 50 individuals from each of the samples were sexed, measured and weighed. The following table summarizes the results of these determinations.

Area	Year Class Composition (Percent)			Average Count per pound Heads-on	Range in Number per Pound
	I*	II*	III*		
Pt. St. George	67	33	negligible**	100	90-112
Crescent City-					
Trinidad Head	65	35	"	109	66-148
Usal	85	15	"	111	62-128
Ft. Ross	97	3	"	111	100-123
San Simeon	6	81	13	50	40-63
Avila-Pt. Sal	20	74	6	57	46-61
Gaviota	8	80	12	51	46-54
Santa Cruz	7	74	19	46	37-52

*I -1 1/2 years old - average

*II -2 1/2 years old - average

*III-3 1/2 years old - average

**Less than 5 percent and included in year class II

Many of the female shrimp contained head roe and a few were carrying spawn. Most of the group I females had head roe and would become first year spawners during the winter. These shrimp had made the transition from male to female last summer.

3. Bottom Temperatures

A total of 131 B.T. Casts was made and bottom temperatures were obtained in all areas where shrimp were found. They are presented in the following table.

Area	Depths (fms)	Average Bottom Temperature (degrees F.)	Average Surface Temperature (degrees F.)
Crescent City-			
Trinidad Head	48-55	48.8	52.6
Usal	57-75	49.7	53.7
Ft. Ross	48-52	50.3	54.8
Avila	110-125	47.9	55.5
Pt. Sal	114-129	47.8	58.8
Gaviota	115-120	49.4	61.1
Santa Cruz Is.	124-128	48.7	63.6

4. Incidental Fish Catches

Incidental fish catches were light in all areas. Counts and average weight of all species from 163 tows were recorded. Unmarketable species such as slender sole, Lyopsetta exilis, hake, Merluccius productus, and juvenile rockfish, Sebastes saxicola, were the principal species.

Personnel:

R. B. Mitchell - Vessel Captain
W. A. Dahlstrom - Biologist in Charge
T. Jow - Biologist, Sept. 27 to Oct. 28
J. A. Aplin - Biologist, Sept. 23 to Sept. 26
Oct. 12 to Oct. 24.